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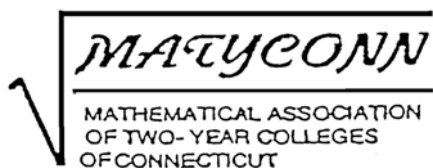
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NEWS

Spring 2003



A "Perfect" Conference

AMATYC's 28th Annual Conference in Phoenix --
with Matyconn members enjoying
perfect weather, presenting and attending
perfect sessions, while having a perfectly
wonderful time...



Architecture for a Capstone Course or Club

A Presentation at the AMATYC 2003 National Conference, Phoenix, AZ

By Patricia Hirschy, Asnuntuck/Capital Community Colleges

Prof. John Pazdar, Peter Wursthorn, Pat Hirschy, and St. Louis colleague Karen Gaines had the pleasure of presenting a session at AMATYC'S 2003 national conference held from November 14-17, 2003 at Phoenix AZ. The purpose of the workshop was to introduce faculty to *Mathematical Journeys I* by helping them research their trip; to encourage faculty to use *Journeys* by sharing information about the management, marketing, and laboratory plans; and to give faculty a helpful "nudge" by wrapping up the session with an All Aboard!

Mathematical Journeys I (www.ccc.commnet.edu/MWP) is a resource and guidebook for community college faculty who are interested in creating and implementing a technology-based, mathematics-anchored interdisciplinary course or club. The book is a product of *The Math Works*, a National Science Foundation-supported grant (DUE0100932) that was administered from Capital Community College and involved community college mathematics faculty from across the nation and Canada. The book contains 10 open-ended Project Labs based on authentic applications. The labs include supportive information, suggested resources, and recommendations to apply a scientific inquiry model using five components: the technology problem, bibliotechnology research, mathematics tools, a model portfolio, and a thesis defense. Faculty Notes offer additional information for the faculty member. Faculty can also find support in guiding new course development through academic committees, in attracting students to enroll in the course through marketing techniques, and in setting up the course with specific course management suggestions.

As part of the AMATYC presentation, Profs. Gaines and Hirschy presented a skit to acknowledge the special challenges to students and to the college in attempting to create a new course. The skit provided a hypothetical conversation between Prof. Ima Go Getter (Karen Gaines), a faculty member at Pazdar Community College, and Dean Bean (Pat Hirschy) regarding Prof. Getter's new *Journeys* mathematics course proposal. Their conversation addressed the benefits of sponsoring such a course, the techniques for recruiting students, the means to determine the success of the adventure, the format of the course, funding issues, and "fresh" approaches from term to term. Some of the stellar characters mentioned in the skit included the CIS faculty member, Prof. H. T. Eml and the library resources director, Ms. Rhea Searcher. (Maybe you had to be there?)

To wrap up the session, the presenters put the participants to work to determine if the

sum of π , $\sqrt{2}$, e , 6 , $\int_0^{10} dx$, and 2^3 was greater than "28", the perfect

number of the conference. As "Dean Bean" explained to the session participants, the Pazdar Community College Executive Council had a secret criterion -- if a faculty member's proposal was weighted greater than the perfect number 28, than the proposal was approved. So, figure it out for yourself -- was Prof. Ima Go Getter's proposal for a *Journeys* course approved?



Report on the 2002 AMATYC Delegate Assembly

***From Alice Grandgeorge,
Manchester Community College***

At the Delegate Assembly of the 28th Annual Conference of AMATYC, there were three items of new business that I would like to bring to the attention of MATYCONN members:

1. Motion to delete "Serve as chairperson of the membership committee" from Article II Duties of the Officers, part D, Treasurer, of the Bylaws. Passed.
2. Motion to adopt the position statement on *Distance Education In College Mathematics Course In The First Two Years*. Passed (see page 4 of the newsletter).
3. Motion to adopt the position statement on *Initial Placement of Community College Students into the Mathematics Curriculum*. Passed (see page 4 of the newsletter).

In addition to these items of business, I would encourage members to visit the AMATYC website at <http://www.amatyc.org> to check out conference electronic proceedings from the Phoenix meeting. Included are descriptions of selected sessions plus handouts in pdf format and/or PowerPoint presentations.

THE DESERT DUDE RIDES AGAIN!

***From Steve Krevisky,
Middlesex Community College***

In November 2002, Matyconn members attended the 28th annual AMATYC conference in sunny Phoenix, Arizona. It was billed as the "Perfect Conference," since 28 is a perfect number! The weather was excellent, and I enjoyed my return to the Southwest. The Desert Botanical Gardens were very nice, and on the way back, I dropped off a car load of NYSMATYC folks who had gotten there without a car.

I was fortunate to give a presentation to a small group regarding what I did and what went on at the ICOTS in South Africa, and I also presided at a session. I renewed acquaintances with friends and colleagues from all over the country.

Some AMATYC members were able to go see Yao Ming and the Houston Rockets play the host Phoenix Suns. The Arizona State football team was still in contention for a bowl bid. Overall, things went smoothly, and I look forward to a prime 29th AMATYC Convention in Salt Lake City in 2003.





AMATYC

The American Mathematical Association of Two-Year Colleges

RECOMMENDATIONS
OF THE
AMERICAN MATHEMATICAL ASSOCIATION OF TWO-YEAR COLLEGES
ON

DISTANCE EDUCATION IN COLLEGE MATHEMATICS COURSES IN THE FIRST TWO YEARS

The American Mathematical Association of Two-Year Colleges (AMATYC) recognizes that technology is readily available to most faculty and a rapidly growing number of students and that its use in mathematics education will continue to offer an ever-expanding window of opportunity to the college students of the 21st century. Distance education can facilitate the mission and goals of two-year colleges by providing an added opportunity for lifelong learning when a traditional delivery method is not a viable option and by providing an alternative learning mode in response to the needs of students both locally and regionally. Distance education modalities include print, audio conferencing, radio, audiocassettes, videoconferencing, videocassettes, computers, on-line via the web, and other multimedia and interactive options. Course delivery may be synchronous or asynchronous. Regardless of the method of distance education delivery, institutions must ensure a sound learning environment when implementing distance education strategies, and to this purpose AMATYC makes the following recommendations.

RECOMMENDATIONS

- **Mathematics distance education programs must be carefully planned.** Special attention must be directed to the needs and abilities of students and faculty. Distance education courses provide students with learning opportunities that may not have previously existed but these courses are not appropriate for all students or all instructors.
- **Faculty expectations of students enrolled in mathematics distance education courses must be clear.** Mathematics faculty should make clear the expectation that students enrolled in distance education mathematics classes must be active learners who are strongly motivated and self-disciplined, participate and interact in class activities regularly, and turn in course assignments on time, just as would be expected of students who attend on-campus classes.
- **Access and equity must be considered when providing opportunities for distance education.** Mathematics is an integral part of all programs of study and so it is especially important that all students who could benefit from distance education opportunities in mathematics have access to them. The technology selected for a distance education course should be fully accessible and understandable to students enrolled in the course. Efforts should be made to maximize student access to the technology and appropriate support services.
- **Training and support for mathematics distance education providers must be part of any distance education program.** Colleges should provide continuous and relevant training and ongoing support as an integral part of their distance education program. This will allow faculty to focus on delivery of course content.
- **Distance education programs must maintain high standards.** Mathematics courses provide a large part of the basis for learning in many other courses and disciplines. Therefore, distance education mathematics courses must meet the content, pedagogical, and assessment standards used in traditional on-campus mathematics courses.



AMATYC

The American Mathematical Association of Two-Year Colleges

POSITION STATEMENT
OF THE
AMERICAN MATHEMATICAL ASSOCIATION OF TWO-YEAR COLLEGES
ON
INITIAL PLACEMENT OF TWO-YEAR COLLEGE STUDENTS INTO THE
MATHEMATICS CURRICULUM

AMATYC recommends that all two-year colleges develop procedures for the initial placement of two-year college students into the mathematics curriculum. The placement process should determine the highest level of mathematics appropriate to students' educational goals at which they have the prerequisite knowledge to be successful. The criteria used to determine mathematics placement should be based on the goals of the mathematics program. *Crossroads in Mathematics: Standards for Introductory College Mathematics Before Calculus* states that placement tests should provide a measure of students' abilities not only to show mastery of algorithmic skills but also to think critically and solve problems (AMATYC, 1995).

A college placement team, led by faculty from the mathematics department, should develop policies and procedures to be used for the placement of all two-year college students entering the mathematics curriculum. These procedures should be applied equitably to all students and use an analysis of multiple measures, which may include:

- High school and college records
- Scores on college entrance examinations
- Scores on placement tests

In addition, student success can be impacted by less quantifiable factors such as motivation; family and work obligations; special student needs; and educational, career, and personal goals. These may also be factors to consider. In all cases, the placement team should make the final decision regarding placement based on an analysis of multiple measures.

All those involved in the testing, advising, and placement of students into the mathematics curriculum should be well versed in the elements of the program. Appropriate staff, facilities, and equipment are essential to the success of the program. It is the responsibility of the college to advise students on policies, procedures, and implications of the placement program prior to enrollment. Opportunities to prepare for the placement test should be provided by the college, and information regarding these opportunities should be disseminated to all students prior to placement testing.

Evaluation of the placement process should be ongoing. Colleges should validate their placement tests and procedures used for initial placement into the mathematics curriculum. Colleges must continually assess placement procedures as content, pedagogy, and technological changes occur which affect the community college mathematics curriculum. Placement procedures must not be used to restrict access to a college education, but rather to ensure that all students who enroll in a mathematics course have the opportunity to achieve success.



Our Tax Dollars at Work

Next time you're looking for new material to add to your mathematics course, or interested in a new professional development experience, or searching for information on a current mathematics education issue, check out the AMATYC Grants Committee web page (www.amatyc.org). The Grants Committee has listed information concerning the National Science Foundation (NSF) grants featured at the poster session held during the AMATYC national conference in November, 2002 at Phoenix, AZ.

Those of you who attended the poster session in person were able to experience first hand the range and diversity of innovative efforts from our fellow community college mathematics colleagues, efforts made possible due to support from the National Science Foundation and tax dollars apportioned from Congress. If you did not have the good fortune to enjoy the poster session, a quick look at the list available from the Grants Committee web page will convince you of the exciting activities happening around us. The list includes the title of the grant, the NSF program funding the grant, contact information for the Principal Investigator, and a link to NSF's FastLane page that includes an abstract of the grant. Topics addressed in the featured grants include teacher preparation, developmental mathematics, calculus, technical mathematics, interactive software, web-based homework, student assessment, computer science/engineering/physics, middle school mathematics, and distance learning. Clearly there is something for everyone, and this list just covers the 2002 poster session. The results of additional NSF grants are available from the NSF web site. So when April 15 rolls around and you're sending in your tax check, try not to think of it as a loss to your budget. Think of it as the opportunity to fund even more educational grants that benefit our exciting world of community college mathematics education.

Take the Journey!

Want to add some pizzazz to your math classes? How about conducting your own CSI (Criminal Scene Investigation) investigation in your trigonometry class with a blood spatter analysis? Or customizing an individual patient's dialysis treatment in your calculus class? Or how about designing your own capstone mathematics course, and better yet-set it up so that the students do all the work? Not sure how to set up the syllabus? Think it's too hard to get the paperwork through your curriculum committee? Then we've got a course for you.

The class laboratories, marketing approaches, course management ideas-all are waiting for you in *Mathematical Journeys I*. Go check your bookshelves for the green paperback book sent to you last spring. You know you have it. Yes the book looked interesting when it arrived in the mail, but you were too busy to sit down with it at the time. If your bookshelves are hidden behind piles of other books and student papers making a shelf search impossible, just crank up the internet and visit www.ccc.commnet.edu/MWP.

What better time than now to start thinking about next term? Spring hasn't come yet, and the only excitement going on outside is the drip-drip-drip of melting snow. Now is a great time to open *Mathematical Journeys I*, muse a little, and let your mind wander to the opportunities for next term's classes.



Pat Hirschy, Asnuntuck/Capital CC

Crossroads Revisited

Patricia Hirschy, Asnuntuck/Capital Community Colleges

How has AMATYC's *Crossroads* document, published in 1995, affected your mathematics teaching? What direction has the document provided? What changes have you successfully implemented? What changes have you tried that were not successful? The nature, quality, quantity, and success of your experiences are valuable to AMATYC and its initiative to "revisit" the 1995 *Crossroads*.

I had the opportunity to attend a session at the AMATYC 2003 National Conference in Phoenix, AZ regarding revision of the 1995 *Crossroads* document. I found the session both reassuring and invigorating. It was reassuring to know that other colleagues are grappling with change as I am, and that I am not the only one who still doesn't "have all the answers." It was invigorating to know that our national perspective regarding two-year college mathematics education will be an ongoing, dynamic, and reflective activity.

The *Crossroads Revisited* project will build on the existing document to create a more refined vision and guidelines. Information already collected from the project indicates that *Crossroads* has affected the two-year mathematics community by providing direction and by impacting on the classroom. Changes in the classroom have affected both content, through contextual experiences and technology, and practices, through collaborative work and different teaching and learning styles. The needs identified as arising from the 1995 *Crossroads* implementation efforts cover student diversity, student learning styles, technology, developmental mathematics, and transfer issues. Barriers to implementing the change envisioned by the 1995 *Crossroads* are diverse and include faculty resistance, lack of resources, access to appropriate professional development opportunities, and lack of time.

Six issues will be addressed in the revision activities: instructional delivery, technology, pedagogy, content, adjuncts, and training new faculty. Further information on the *Crossroads Revisited* project can be found on the AMATYC website, www.amatyc.org. I encourage you to visit the web site and see how you can add to the revision process. Your individual experience is part of a collective process that reflects all of our experiences. And your input can play a role in the newest articulated vision of two-year college mathematics.

Other Conference Notes



Betsey Doane, Housatonic Community College

I just returned from AMATYC and thoroughly enjoyed the workshop on doing mathematics with the keyboard in Word (it's a great invention for those who are visually impaired). I attended a lot of talks on the teaching of statistics, met new people and had a wonderful time! It was wonderful to see so many Connecticut people there as well.

Slav Sharapov, Quinebaug Valley Community College

Marion Egan was nominated for and received a distinguished service award of \$5000, to be used for professional development activities. She and I spent her money in Phoenix, attending the AMATYC Conference. My favorite sessions were dedicated to technology use at different levels, developmental through calculus. I was especially impressed with the Java Applets for visualization in calculus classes.

Alphabet Soup

Decode this for breaking news.....



NVCC

PASAL

PI

STEM

IPS

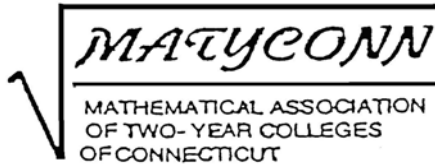
The National Science Foundation awarded Naugatuck Valley Community College a 3 year Planning Grant titled Partners to Atract and Sustain Adult Learners (**PASAL**). The Principle Investigator, Dr. Bonnie Simon, is hoping to increase enrollment at the college in Science, Technology, Engineering and Mathematics (**STEM**) degree programs by 3% annually; and increase the total **STEM** graduates or transfers 2% annually. Using multiple strategies necessary for the very heterogeneous community college population, **PASAL** will help current **STEM** degree students succeed as well as attract new students, by motivating and reinforcing them through direct, visual, and multiple connections with **STEM** industry work sites, work experiences, and one-on-one support. In addition to external populations, **PASAL** focuses activities to attract students from the large pools of students in General Studies and Continuing Education programs.

The **PASAL** planning and pilot project objectives and methods are: 1. Accelerating an ongoing college effort to expand the number and support level of Industry Partners (**IPs**). The ideal **IP** relationship is evolving to include involvement in attraction activities, and/or provision of jobs, scholarships, program financing, tutoring and mentoring. 2. Facilitating prospective and current **STEM** student exposure to **STEM** careers, by embedding in college recruitment, orientation, advising, and instruction a variety of Web-based links to **STEM** employers and Web-based virtual tours which enable visualization of real work sites and tasks. 3. Combining Industry Partner involvement and Web-based material in a concerted effort to attract the college's large population of General Studies majors and Continuing Education students to **STEM** degree programs. 4. Sustaining **STEM** student interest and effort through mathematics study that is particularly challenging to community college students by emphasizing the application of mathematics principles to **STEM** careers. 5. Sustaining **STEM** pursuit among the many community college students whose financial, family, and job responsibilities cause even the best students to be at-risk for attrition, through an Early Alert service which proactively identifies, supports and refers students showing early signs of difficulties.

PASAL's intellectual merit is that it helps answer the question of how to increase the supply and success rate of future **STEM** majors, including underrepresented groups, who are coming through the large nationwide community college pipeline. **PASAL** findings are expected to shed light on the extent to which visualization and exposure to **STEM** careers positively influences students to engage and to persist in **STEM** degree programs, and whether early intervention is an important and effective tool to prevent attrition among community college students.

PASAL's broader impact is that the model is specifically designed to be readily replicated by any community college. Nearly half of U.S. undergraduate student enrollments are in community colleges, and two-year colleges account for over one-third of all undergraduate student enrollments in **STEM** degree programs. **PASAL** findings would help identify cost-effective strategies that under-resourced colleges can use to attract and sustain students who tend to have multiple barriers, and other effective ways to convert the substantial pool of Continuing Education and General Studies students to **STEM** degree programs

Bonnie Simon
Naugatuck Valley Community College.



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Conferences/Workshops

ATOMIC Spring Conference 2003, "APPROACH! APPLY! ACHIEVE! Be a survivor in your math class!" March 17 (Grades 7-16), March 18 (Grades K-8), Radisson Conference Center, Cromwell, CT <http://www.atomic.necaweb.com>

NEMATYC 2003: "Cookin' Up a Conference," March 28-29, Johnson & Wales University -- Culinary Campus, Providence, RI <http://www.bristol.mass.edu/nematyc>

NCTM 81st Annual Meeting, "Building Mathematical Communities," April 9-12, 2003, San Antonio, TX <http://www.nctm.org/meetings/sanantonio/index.htm>

17th Annual CSU Academic Computing Conference, April 12, 2003, Southern Connecticut State University, New Haven, CT <http://so-mako.sysoff.ctstateu.edu/acc/acc2003.nsf>

AMS 2003 Spring Eastern Sectional Meeting, April 12-13, 2003, New York, NY
<http://www.ams.org/amsmtgs/sectional.html>

MATYCONN Spring Meeting, April 25, 2003, Capital Community College, Hartford, CT
<http://155.43.16.5/matyconn>

AMATYC 2003 Summer Institute: "Making Math Meaningful Through Workplace Research," May 18-23, 2003, Wake Technical Community College, Raleigh, NC
<http://www.waketech.edu/~ljwillif/research.html>

AMATYC 2003 Summer Institute: "Developmental Algebra Using a Function Approach," June 8-13, 2003, Duck, NC <http://www.amatyc.org/SumInst/2003/OuterBanks.html>

AMATYC Teacher Preparation Summer Institutes, July 10-15, Seattle, WA
<http://amatyc.dtcc.edu>

MAA 2003 MathFest (National Meeting), July 31-August 2, 2003, Boulder, CO
<http://www.maa.org/meetings/meetings.html>

AMS 2003 Fall Eastern Sectional Meeting, October 11-12, 2003, Binghamton, NY
<http://www.ams.org/amsmtgs/sectional.html>

T³ Regional Conference, October 17-18, 2003, Worcester, MA,
T³ Regional Conference, October 18-19, 2003, New York, NY
<http://education.ti.com/us/t3/conferences/regional/regional.html>

NCTM Regional Conferences, November 6-8, 2003, Charleston, SC, November 20-22, 2003, Edmonton, Alberta <http://www.nctm.org/meetings/index.htm#regionals>

AMATYC 29th Annual Conference, November 13-16, 2003, Salt Lake City, UT
<http://www.amatyc.org>

MAA & AMS Joint Mathematics Meeting, January 7-10, 2004, Phoenix, AZ
<http://www.maa.org/meetings/meetings.html>, http://www.ams.org/amsmtgs/2004_intro.html

16th Annual International T³ Conference, March 12-14, 2004, New Orleans, LA
<http://education.ti.com/us/t3/conferences/international/international.html>

NCTM 82nd Annual Meeting, April 21-24, 2004, Philadelphia, PA
<http://www.nctm.org/meetings/>

MAA 2004 MathFest (National Meeting), August 12-14, 2004, Providence, RI
<http://www.maa.org/meetings/meetings.html>

Minutes of Spring 2002 MATYCONN Meeting
Naugatuck Valley Community College
May 10, 2002

The meeting was called to order at 3:15 pm by President Robert Lynott.

1. Welcome

Bob welcomed all and introduced Mike and Marianne Connors as representatives of Texas Instruments. Marianne, assisted by Mike, gave a demonstration of using the graphing calculator.

2. Approval of meeting minutes.

The November 2, 2001 (date amended to 2001) meeting minutes were approved as amended.

The May 4, 2001 meeting minutes were approved. (Note: Minutes are available on the MATYCONN website.)

3. AMATYC Business

Jack Keating was present and distributed forms for individual and institutional membership. Jack also announced the 28th AMATYC Conference will be held in the fall 2002 in Phoenix, AZ. Other information Jack disseminated included the "Opportunities for Excellence" publication, AMATYC Teaching Excellence Award, and open AMATYC Officers positions. Further information is available at www.amatyc.org.

- S. Krevisky inquired as to whether the delegates were the same. They are.

4. Math Contest

- S. Krevisky reported the results: 2 perfect scores, 1 – 39, and a couple of 38's. \$300 is available for prizes with money received from six schools. Steve asked if MATYCONN wanted to add to the prize money.

K. Bavelas moved to have MATYCONN supplement the prize money with \$300. A. Grandgeorge, second.

J. Zimmerman clarified that there would be a seventh school and therefore \$350. Motion passed.

- Next year's contest is April 13.

- Allocation of prize money was discussed.

Each winner will receive \$200 and a plaque. Honorable mention winners will receive a certificate.

- Steve expressed concern at the low number of students that participate.

5. Minority Scholarship

Bob Lynott presented the following as discussed by the executive board: possibly changing the name to MATYCONN Scholarship, having 3 \$100 scholarships in the categories minority, developmental, and college level. Historically the intent was to provide a small stipend for the future study of mathematics. Bob also asked about the notion of possible criteria and selection of students (e.g. apply of faculty recommend).

Discussion:

- Should background or character of students be taken into consideration?

- Historically, students were solicited to apply and then each campus forwarded one name for each category.

- It was commented that this should not be a prize, rather students should have to fill something out.

- Possible areas for consideration high GPA, minimum number of credits (in courses overall).

- Possible thought: Can the Minority scholarship be folded into the math contest? A student must take the contest, if a minority then the highest score gets the scholarship.

6. By-Laws

- The Webmaster position was voted unanimously as an official office of the executive board.

- Bob Lynott announced that the executive board would like to remove the stipulation that the president be selected from the current executive committee. This is to be voted on at the fall 2002 meeting.

- K. Bavelas inquired whether there should be a president-elect position.

- S. Krevisky asked whether the position should be a member of the executive committee.

7. Academic Support Services

Bob Lynott presented the following drafted by the executive committee. The intent is to send it to Chancellor Herzog as a MATYCONN position statement.

“ As part of the mission of the Community Colleges of CT, to accommodate the needs of our students, and to support life-long learning, MATYCONN recommends that there be a separate line item in the budget to provide tutoring services especially in the academic area of mathematics”.

S. Krevisky made a motion to send the statement. Passed.

8. Treasurer's Report

- Jill Zimmerman distributed a report of the MATYCONN account, current balance \$7308.29.
- S. Krevisky made a motion to accept the report. Passed.
- Jill informed the body of an outstanding check for \$200 written to a math contest winner (Walter Woodland) from about 1 year ago.
- Jill announced that prior to her work there was no accounting of the scholarship fund and she would start one. A. Grandgeorge recollected that previous reports had that amount. Jill would check into this.

9. Election of New Officers

- Alice Grandgeorge made a motion that flowers be sent to Naugatuck Valley CC support staff for their assistance in preparing the Newsletter, along with a letter of recognition to Bonnie Simon and Elaine Dinto. Passed.
- A. Grandgeorge presented the slate of nomination for officers and called for additional nominations. K. Bavelas moved to close nominations. S. Krevisky second.

- The slate was approved as one ballot cast. Officers for 2002 – 2003 are:

President:	Bob Lynott
Vice-President:	Alice Burstein
Secretary:	Barbara Paskov
Treasurer:	Jill Zimmerman
Membership Chair:	Cora Preibis
Math Contest Coordinator:	Steve Krevisky
Minority Scholarship Chair:	Slav Sharapov
Newsletter Editor:	Bonnie Simon
Newsletter Editor and Webmaster:	Elaine Dinto

10. Future Meeting Dates and Locations

Fall 2002 – S. Krevisky offered Middlesex CC – date of October 25 suggested. Suggestions for topics: Teacher certification. J. Keating reported that AMATYC is also doing a lot of work in this area.

Spring 2003 – K. Herron offered Capital CC

11. Announcements

- A thank you to Cora Preibis for her work on the MATYCONN directory.
- Steve Krevisky announced that copies of the math Contest are available.
- Al Buatti – AAUP representative, AAUP.org – announced that Middlesex CC faculty have badges and that in the fall students will also.
- S. Krevisky – International Conference on Teaching Statistics is being held in Africa this fall.
- J. Keating announced that OCMA Meeting is in Toronto.

The meeting was adjourned at 4:10pm.

Respectfully submitted,
Barbara Paskov
MATYCONN Secretary

MATYCONN 2002 Spring Fling Workshops



Matyconn member Al Buatti, Middlesex CC (left) discusses new TI technology with Dr. Mary Ann Connors, Department of Mathematics, Westfield State College, Westfield, MA and her husband, Ed Connors, prior to their MATYCONN presentation (05/10/02) on using the TI-89 to teach precalculus topics.

Math in the Movies

Barbara Caserta, Naugatuck Valley Community College (aided by Naugatuck Valley's own Bob Lynott)

Bob Lynott and I always are talking about movies, DVD's, sound systems, and one day we started talking about math topics in movies. Bob mentioned he'd like to do a presentation at Matyconn about this. I wanted to learn about making VCD (Video CD's) and DVD's at home, so I volunteered (which is sooooo typical).

It was a labor of love. I learned (the hard way, of course) how to do digital video (for DL courses someday) and got a chance to view a lot of movies ... everybody's happy!

I learned a lot about editing -- I had to cut out the Professor's comment to the obnoxious student in "It's my Turn" with Jill Clayburgh, who plays the Math Professor, (F--- face). And, "Die Hard with a Vengeance" -- had to *heavily* edit that for content -- oh, that Bruce Willis!



Real-Time Weather

John Bagioni, Naugatuck Valley Community College

At the 2002 MATYCONN Spring Meeting, John Bagioni, seasoned science teacher at Wolcott High School and Instructor of Meteorology at Naugatuck Valley Community College, demonstrated how to use live, current, interactive Internet weather information to teach all major components of his meteorology curriculum, along with the unavoidable connection between mathematics and weather.



The recipient of a "Celebration of Excellence" award for the development of a hands-on real-time meteorology course called "Real-Time Weather," John accessed several web sites, including that of NOAA, the National Oceanic & Atmospheric Administration (<http://www.noaa.gov/>), giving real-time examples of how these sites could be used to supplement a meteorology course textbook

In addition, he answered a variety of questions regarding current and future weather-related conditions including the drought, El Niño, and expected summer and winter long-range patterns.



Photos are from the National Weather Service Historical Image Collection at <http://www.photolib.noaa.gov/historic/nws/index.html>.

Minutes of Fall 2002 MATYCONN Meeting

Middlesex Community College
October 25, 2002

The meeting was called to order at 3:40 p.m. by President Robert Lynott.

1. Welcome

Bob welcomed all to the meeting.

2. Approval of meeting minutes.

The May 10, 2002 minutes were approved. Elaine Dinto noted that the minutes of the meeting are on the Matyconn website.

3. Treasurer's Report

Jill reported that among the expenditures were expenses for filing the corporate annual reports for 6 years (through 2002). Also, one of the Math Contest winners didn't receive a check and a new one was issued. Walter Woodland, a past winner from Gateway has not cashed his check. The current balance is \$ 7142.10. Kathy Bavelas made a motion to approve the minutes. Passed.

4. AMATYC Business

Steve Krevisky represented Jack Keating of AMATYC, as Jack was unable attend the meeting. Steve noted that the AMATYC meeting will be held in Phoenix in several weeks. The members will vote on a couple of motions. Steve will do a presentation on his visit to South Africa while attending the International Conference on Teaching Statistics this past summer. He mentioned that Kunle was also there. The next AMATYC meeting, one year from now, will be held in Salt Lake City, Utah. Delegates should share any concerns with Steve to be addressed at the meeting. We should also do the paperwork for the \$ 200 affiliate grant.

5. Newsletter/ Website Updates

Bonnie and Elaine are encouraging people to let them know what is going on at the members' colleges for inclusion in the newsletter. The website has been updated with conferences and so on. Also, members are to check the website for corrections. If you wish to be a campus representative, please let Elaine know.

6. Membership Update

Cora reported that there are 65 current members. An update letter was mailed early in October and Jill has received membership applications from several new members. Bob mentioned that we should do something to address the adjunct faculty, and encourage them to join. Bonnie also mentioned that we might have a promotion such as "Bring One, Get One Free," whereby a current member might receive free membership dues for a year for encouraging a person to join, or receive some other incentive – free meeting fees and dinner, for example.

7. Math Contest

Steve K. reported that the 13th Annual Contest would be held in April 2003. The date was set for Saturday, April 12, 2003 after discussion with the members. Steve asked the membership to help recruit students on their own campus. He also asked for help in writing contest problems. He would like to form a Problems Committee. If anyone is interested, please contact Steve. The contest is 20 questions worth 40 points. The time allowed to complete the test is 2 hours. Each participant should have completed math coursework through Intermediate Algebra. Steve also noted if the scores were reported early enough, we would be able to honor the top winners at the Spring Matyconn meeting. Steve noted that each campus sends \$ 50.00 to Jill to participate. These funds become part of the pool for system prizes. Each winner would receive \$ 200.00, and if possible local prizes should be awarded through the PTK or the College Foundation, or other sources.

8. Minority Scholarships

Four scholarships of \$ 250.00 each were approved. They will be awarded starting in the spring of 2003. Names of applicants should be forwarded to Slav, Chair and other committee members to review applicants. Other applicants who have been recommended may receive honorary mention.

- Bob asked what were the criteria for choosing the participants, and how would this pool be reduced to four.
- Kathy B. wanted to raise the bar for Q.P.A. to 3.0 and set some level of minimum math requirements – perhaps Pre-calculus or College Algebra.
- Miguel suggested that this be put on the website – “**Minority Scholarships Coming Soon**”
- Bob's job to notify Slav, and then Slav to send out notice of criteria and applications to different colleges so that applicants can be chosen.

- Miguel said that the By-laws would have to be changed regarding “What is minority?”
- Bonnie suggested perhaps 4 different types of scholarships with different criteria.
- Miguel thought that the applicants should have 6 credits beyond Intermediate Algebra, with a Q.P.A of 3.0 in math, and overall Q.P.A. of 2.5 as minimum requirements
- Peter W. agreed that the applicants should have a minimum number of credits.
- Steve K. suggested an active functioning committee headed by Slav. Joe volunteered.
- Elaine recommended connecting the Minority Scholarship with the Math Contest.

9. Math Issues

Miguel said there was an approved schedule of meetings of the Math Issues Committee – 3 meetings for fall and 3 for spring. The next meeting will focus on Intermediate Algebra. He will meet with Phil Cocchiola regarding common course numbering, and how it will continue to evolve.

He spoke of a new feature – honor the fact that “we love math so much” to share new ideas and technology. There will be a larger meeting in the spring to exchange pedagogical and mathematical ideas. The meetings are as follows: November at Central Connecticut, December at Central Connecticut, February at Gateway, March at Central Connecticut, and April at Gateway.

Miguel said the committee discussed the Certification of Teachers and the Alternate Route to Certification.

10. By-Laws

We will remove the stipulation that the President needs to come from the “Executive Committee.”

- Elaine mentioned that we might do an e-mail vote. The by-laws will be put onto the web site. We will look at the By-laws in general
- The executive committee will meet in January to discuss the above.
- Miguel thought members of the Executive Committee should e-mail comments to Bob L.
- Kathy suggested that a candidate must be a member for 1 or 2 years. She also mentioned that if we remove the criteria now, we might not have new criteria in place before the next vote.
- Jill suggested that we set a deadline for the above.
- Miguel said to postpone vote until the spring meeting since this is a by-law change. He also mentioned that electronic balloting should also be part of any By-laws change.
- Steve – if we send to 65 members, we can mail
- Steve made a motion to table the By-laws amendment. Kathy seconded.

11. Math Issues Committee/Reform Math

The Math Issues Committee will discuss Reform Math – how to choose books, which methods of delivery are most effective.”

- Bob voted to bring this up at the Matyconn meeting. Also said “good idea for a conference?” Might bring in speaker, have a workshop. Need ideas for an early spring conference that Matyconn will host.
- Miguel – we should have a statement for the Math Issues Committee and Matyconn to collaborate.
- Sandy mentioned that we need real data to speak on these issues, and need people with expertise to present new and innovative ideas.
- Steve made a motion to co-host Math Issues and Matyconn for the spring meeting.
- Steve – NEMAYTC will be *Cooking up a Conference* at Johnson & Wales in March 2003. (Steve passed out a leaflet on this).

12. Nominating Committee:

- Joe Karnowski (Norwalk), Kathy Bavelas (Manchester), Elaine Dinto (Naugatuck Valley)

13. Other Business

- Kathy B. voiced concerns about the 2-year proposal to the Board of Trustees, Department of Higher Education. In March, transfer program was to appear at UConn. She talked to several state legislators. This task force has yet to be convened. Very few elementary school teachers have sufficient math skills.
- To help address the critical shortage of mathematics teachers in the state, and in accordance with the position of AMATYC, Elaine made a motion, seconded by Steve, that MATYCONN support the involvement of community colleges in teacher education mathematics courses and related programs. Motion passed.

14. Future Meeting

- Peter Wursthorn offered Capital Community College for the Spring 2003 meeting.

The meeting was adjourned at 4:45 p.m.

Respectfully submitted,

Cora Preibis, Membership Chair, for Barbara Paskov, Secretary

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A Relationship between Fibonacci Numbers and the Chinese Zodiac

Presented by
Sam Sagong
Assistant Professor
Middlesex Community College
October 25, 2002

Joseph Louis Lagrange observed that the final digits of Fibonacci numbers recur after a cycle of 60. The Chinese Lunar Calendar, dated back to 2637 B.C., employs two characters to name each year. The first character is from an ordered set of 10 characters, called Celestial Stems, and the second character is from an ordered set of 12 characters, called Earthly Branches. These 12 branches are commonly known as the Chinese Zodiac, symbols representing 12 animals. The names of the Chinese Calendar also recur after a cycle of 60.

In his thought-provoking presentation for MATYCONN members at the Fall 2002 Meeting, Sam demonstrated a one-to-one correspondence between the 60-cycle of the final digits of Fibonacci Numbers and that of the Chinese Calendar. Thank you, Sam, for enlightening us!

Chinese astrology has a history of more than 3,000 years. Ancient Chinese people invented the 10 Heavenly Stems and 12 Earthly Branches for chronological purposes. However, since most people were illiterate, 12 animals were designated to symbolize the 12 Earthly Branches in order to be better remembered. These lucky animals are rat, ox, tiger, rabbit, dragon, snake, horse, sheep, monkey, rooster, dog and pig successively.

According to legend, many years ago Buddha summoned all the animals to a meeting in which he would designate the first 12 animals arriving, to be signs of a year respectively. On the night before the departure, cat notified his pal, rat, and they agreed that the one waking up first the next morning must awake the other so they can depart for the meeting together. However, rat broke his promise and arrived for the meeting alone. Then, ox, tiger, rabbit, dragon, snake, horse, sheep, monkey, rooster, dog and pig arrived one after the other. When cat woke up and hurried there, the meeting was over. It is said that is the reason why the cat kills rats.

Chinese astrology argues that one's personality profile can be revealed from one's birth time. However, Chinese zodiac is based on the year rather than in the month as in the western system. In China everybody knows which animal sign he or she is born under.



The Art and Geometry of Pavements, Old and New
Originally scheduled for October 25, 2002



Due to Technical Difficulties.....

The previously recorded program will now be shown in its entirety on April 25, 2003, at Capital Community College. Judith Moran will present her collection of tilings.

SAVE THE DATE

of

April 25, 2003

for the

MATYCONN SPRING MEETING

at

Capital Community College

New campus in Hartford

DETAILS TO FOLLOW

Here ye, Hear ye!!



Coming on April 12th to your campus!

It's the 13th Annual Math Contest

IS YOUR CAMPUS PARTICIPATING?

On April 12, 2003, students from two-year colleges across the state will have the opportunity to participate in MATYCONN's 13th Annual Math Contest. Every Math Department within the Community College system is encouraged to participate and support this event!

The mathematics content included in the contest is through the Intermediate Algebra level. Problems may include applications, geometry, logic, basic statistics, quadratic equations, etc. Students need to think critically, and advanced students might not have an advantage. Students need to solve twenty questions (worth from 1 to 3 points each) in two hours, so time is a factor. All answers must be complete, with proper units or labels (no partial credit); calculators are allowed.

Each participating campus contributes \$50 towards system prizes (money should be sent to Jill Zimmerman, MATYCONN Treasurer). This money is then available for student prizes; MATYCONN, as the sponsoring organization, also contributes. System-wide, plaques are given to the top winners. In addition, each campus is encouraged to give local prizes to their winners, including cash awards and certificates.

Last year's contest was a great success thanks to the following colleges and their contact people: Gateway (Miguel Garcia), Manchester (Mike Robillard), Middlesex (Steve Krevisky), Naugatuck Valley (Bob Lynott), Norwalk (Marilyn Seman), Quinebaug Valley (Slav Sharapov), Three Rivers (Cliff Benson), and Tunxis (Lori Fuller). The top two contest winners were Anthony Gentile of Norwalk and Keth Sunthary of Three Rivers, both with perfect scores of 40 – ***Congratulations!***

For more information about MATYCONN's Annual Math Contest, or if you would like to contribute a problem or two, please contact Steve Krevisky at Middlesex Community College, (860) 343-5792, SKrevisky@mxcc.commnet.edu.



F. Y. I.

HELPING TO ADDRESS THE TEACHER SHORTAGE

To meet the needs of providing more teachers and for enticing students into careers in teaching, specifically mathematics, more and more CC campuses are offering Number Systems courses that are geared for prospective elementary school teachers. Manchester, Naugatuck, Gateway...have such courses. Some campuses such as Manchester have done extensive work over the past years to develop a program for prospective teachers. Dialogue has begun among community college colleagues to address various issues surrounding teacher education programs. As campuses continue to offer these courses we can hope that more students might become interested in teaching mathematics.

.....

MATYCONN Executive Board members are currently undertaking the task of reviewing and incorporating previous changes into the **MATYCONN Constitution and By-laws**. Further information will be available at the Spring 2003 meeting.

.....

In an effort to try to **EXPEDITE THE BUSINESS MEETING** and to insure all topics are addressed please respond to MATYCONN Secretary Barbara Paskov (BPaskov@mcc.commnet.edu) with the following:

1. Agenda items and a brief explanation of the item.
2. Any announcements to be made at the meeting (note: announcements will be included at the bottom of the agenda in a narrative format with a contact name so interested individuals know who to contact for further information).

.....

www.math.smith.edu/phylo/expo, an interesting website from T.H.E. Newsletter for February 19, 2003, is dedicated to the explanation of the intricate spiral patterns found in common flowers and vegetables, as well as how these patterns develop. The online exhibit, titled "Plant Spirals: Beauty You Can Count On," is produced by members of the botanical garden and the mathematics department at Smith College in western Massachusetts.

.....

A limited number of **MATYCONN scholarships** are available this spring for minority students. Please nominate a student, and write a letter explaining why you think the student is deserving of a scholarship. Send information to Slav Sharapov, Minority Scholarship Chair, SSharapov@qvc.comnet.edu

.....

View the web version of MATYCONN Newsletter at <http://155.43.16.5/Matyconn>

Fun and Games

These puzzles represent common expressions. See if you can solve them by carefully noting the positions of words and pictures.

<p>1.</p> <p style="text-align: center;">E L T T A B</p>	<p>2.</p> <p style="text-align: center;">ground</p> <p style="text-align: center;">feet feet feet feet feet feet</p>
<p>3.</p> <p style="text-align: center;"><u>Man</u> Board</p>	<p>4.</p> <p style="text-align: center;">TIRE</p>
<p>5.</p> <p style="text-align: center;">DKI</p>	<p>6.</p> <p style="text-align: center;">A R U P M S</p>

1. Uphill Battle 2. Six Feet Underground 3. Man Overboard
4. Flat tire 5. Mixed Up Kid 6. Up in Arms

News from Capital:

Kathleen Herron reports --

We have administered a writing assignment and a math assignment across courses to assess where students are in those areas. A professional day on February 21 focused on where we've been, what we've done and what we've learned, with the assistance of a consultant, Dr. Barbara Wright. We decided to share our findings and invited people from other public community colleges to attend the day's events.

News from Manchester:

Barbara Paskov reports --

It has come to the attention of this reporter that our organization has a dastardly duo operating within. They are the "Tag-Team-Twins," or T³ if you prefer a mathematical twist. These two seem to engage in covert operations in the planning, organizing, and compiling of the MATYCONN Newsletter. Thanks T³ for your time, effort, and fun!

News from Naugatuck Valley:

Scott Ferriss reports --

The math department is investigating the feasibility of Math 102L, which would be a 3 day a week, 4 contact hour Intermediate Algebra course to include a laboratory component.

Sandy Pettinico reports --

I've designed Mathematics for Elementary Education II (Geometry and Statistics) which was approved and will be offered in Fall 2003.

News from Northwestern:

Greg Banks reports --

We're having to sacrifice substantial parking areas and a number of general-purpose classrooms are being sacrificed to achieve a library closer to existing buildings and to achieve new science and art classrooms.

With Kunle's continued educational leave (we still anticipate his return next fall) I'm mentoring even more adjuncts this year as we try to keep up with the "exploding" math enrollments.

Keith Adams is going to get Northwestern back into its participation in the math contest this year.

News from Norwalk:

Marilyn Seman reports --

Norwalk is going to host a MATH DAY on May 2, 2003. We are having 6 morning sessions and 6 afternoon sessions for students, beginning at 8:30 a.m. and ending at 2:50 p.m. We invited all the middle schools in the state, and volunteered to host 120 students for the day. Due to an overwhelming response, we have had to restrict the number of students that have applied. Each student will attend 4 one-hour sessions. We are really looking forward to the day!

Joe Karnowski reports –

I took my MAT 106, Math for the Liberal Arts, class to the Artist's Market in Norwalk, CT. The Market, a mostly retail establishment, contains one of the largest displays of original M.C. Escher prints in the world. The owner of the Artist's Market, Jeffrey Price, gave a presentation about Escher and his work. Mr. Price provided great historical detail about Escher, his mathematical abilities and why his work was important to the study of mathematics. Students in the MAT 106 class have just begun studying tessellations and tilings. In addition to writing a short summary of the presentation, they will also be required to do a poster project involving tilings.

News from Quinebaug Valley:

Slav Sharapov reports –

From a random drawing, I won a Classroom Performance System by eInstructions. This consists of 30 portable remotes, receiving units, and software, valued at approximately \$3000. Among other uses, it gives immediate feedback of students' understanding of a particular multiple-choice question, because it calculates the distribution of answers.

News from Three Rivers:

Larisa Alikhanova reports –

New 4-credit courses include: Basic Math Skills and Basic Algebra (one section of each, on an experimental basis), also Calculus I and II (changed, finally, from 3 credits). A common final examination in elementary algebra was administered in Fall 2002; a report on the results will be forthcoming.

New full-time faculty are June Decker, Barbara Maurice -- welcome to new math faculty! (Hopefully new MATYCONN members ☺).



**And,
Matyconn's
youngest
member,
Ruslan,
reports –**

**“One, two,
I’m counting
on you!”**

**Corner
campus**

STEVE K's SOJOURN TO THE SOUTH (SOUTHERN HEMISPHERE)

By Steve Krevisky, Middlesex Community College

In July 2002, I was fortunate to be able to attend the International Conference on Teaching Statistics (ICOTS) in Capetown, South Africa. This was my 4th ICOTS, having also been to the ones in British Columbia in 1986, New Zealand in 1990 and Morocco in 1994. I had the chance to do a presentation, as a contributed paper, on my research on the NCAA Basketball tournament. It was titled *TREES, PROBABILITY AND PREDICTION*, which discussed various aspects of this event. With the tree diagram perspective, and talking about upsets, I was able to relate to an international audience, especially when I referred to the recent World Cup in soccer, when many favorites lost. It was a good experience. I was also able to chair a session as well.

I had been to North Africa before, but this was my first time in Southern Africa. I met nice people from all over the world, and I also got to do some sightseeing. We viewed the Cape Flats, where we saw the townships, and people unfortunately still living in relative poverty. The children were very friendly, which made a lasting impression. We also got to see the Cape of Good Hope, and Cape Point, the southwest tip of Africa, which was quite memorable.



I also arranged for a post-conference tour up to Namibia, which used to be German South-west Africa. I enjoyed visiting the Namib Dunes -- the oldest desert in the world, and also Etosha National Park, where I saw giraffes, zebras, elephants, and many others, all in their natural habitat! This was also a good experience!



I finished with some time in London, where I could unwind a little, and made side-trips to Brighton, Cardiff and York.

In 2006, the next ICOTS will be in Brazil. Any one want to go south again?



TREES, PROBABILITY AND PREDICTION
A PRESENTATION FOR THE ICOTS IN SOUTH AFRICA
BY PROF. STEVE KREVISKY
MIDDLESEX COMMUNITY COLLEGE
MIDDLETOWN, CT., 06457, USA



In basic Statistics classes, we are often interested in TREE DIAGRAMS, which provide a visual way for our students to compute how many ways various events can occur. One special example of this is the US National Collegiate Association of America (NCAA) Basketball tournament, which takes place in March of each year. Fans get caught up in “March Madness,” and enjoy trying to predict the “Final Four.”

In this paper, we discuss many aspects of this tournament, including sharing of what the Tree diagram looks like, various probabilities of what different teams will do, and making predictions about what will happen in the First Round and beyond.

The NCAA Tournament consists of 4 Regions, with 16 teams in each region. The Regions are named East, South, Midwest and West. Within each region, the teams are seeded from 1 to 16, with #1 being the highest seed (strongest team) and #16 being the lowest seed (weakest team). The NCAA Selection Committee chooses and seeds teams for this tournament based upon their won-lost records, strength of schedule, opponents’ strength of schedule, and so forth. All of this is put together in a mathematical formula called the RPI Rating. These selections can be quite controversial, and it’s fun to speculate and PREDICT who will win.

While the strongest teams (highest seeds) do have an advantage overall, in terms of the likelihood of winning, the First Round can produce many UPSETS. In each region, the 1 seed plays the 16 seed, the 2 seed plays 15, 3 plays 14, and so forth. In what follows, I will present PROBABILITIES based upon 17 years of data, from 1985 to 2001 (2002 data to be presented at the conference).

We present some preliminary PROBABILITIES as follows:

1. Over 17 NCAA Tournaments, a #1 seed has won the championship 10 times, so that $p(\#1 \text{ seed winning the championship}) = 10/17$.
2. In March, prior to the start of the tournament, there is a final, pre-tournament poll of the top 25 teams. The #1 ranked team in this poll rarely wins the tournament!! It has happened only 3 times! Hence, $p(\#1 \text{ ranked team in final pre-tournament poll winning the championship}) = 3/17$.
3. Only twice in 17 tournaments has a seed lower than 4 won the championship. Thus, $p(\text{seed lower than 4 winning the championship}) = 2/17$.
4. Just 3 teams ranked out of the top 10 in the final pre-tournament poll have won the Championship. Therefore, $p(\text{team ranked out of top ten in poll winning the championship}) = 3/17$.

Next, while #1 seeds have good winning chances, they often fail to make the Final Four, which consists of one team coming out of each of the 4 regions. Each region has a #1 seed, so there are 4 #1 seeds each year. In 17 years of data, at least one #1 seed has failed to make the Final Four each year -- no exceptions through 2001!

We analyze this as follows:

5. $p(\text{all 4 \#1 seeds reaching the Final Four}) = 0/17 = 0$. In other words, this event has never happened!
6. $p(\text{3 of the 4 \#1 seeds reaching the Final Four}) = 3/17$. This has happened 3 times.
7. $p(\text{2 of the 4 \#1 seeds reaching the Final Four}) = 7/17$. This has happened 7 times.
8. $p(\text{1 of the 4 \#1 seeds reaching the Final Four}) = 7/17$. This seemingly unlikely event has happened 7 times!!
9. $p(\text{0 of the 4 \#1 seeds reaching the Final four}) = 0/17 = 0$. This event has never happened!

Low seeds, especially 10 or lower (11 to 16), rarely go deep into the tournament. Only once in 17 years has a double digit seed reached the Final Four (in 1986).

10. $p(\text{double-digit seed reaching the Final Four}) = 1/17$.

Much of the fun of the NCAA Tournament is predicting FIRST ROUND UPSETS, which happen every year! I define an upset as occurring when a lower seed beats a higher seed, provided that the difference between the seeds is at least 5. Therefore, 11 beating 6, 12 beating 5, and so forth, would classify as upsets. I view the 8 vs. 9 and 7 vs. 10 games as toss-ups, although if you include 10 beating 7, the upset potential jumps considerably. It's interesting to note that 9 seeds have a winning record vs. 8 seeds in first round play! There are 32 first round games. If we remove the four 8 vs. 9 games (one in each of 4 Regions), then there are 28 first round games with upset potential. We note the following:

11. $p(10 \text{ seed beating a } 7 \text{ seed}) = 28/68$, which is close to 50% !

If you remove these 4 games, then there are 24 possible first round games which qualify as upsets by my definition above. My research shows that since 1985, when the NCAA Tournament went to its current format with 64 teams (actually, now there are 65 teams because of the play-in game, which started in 2001), at least one upset has occurred every year-no exceptions!! We analyze this as follows:

Over 17 years, there are four 11 vs. 6 games (one in each region), four 12 vs. 5 games, and so forth, so that there have been 68 of 11 against 6 games, 68 of 12 vs. 5 games, and so on, over these years.

12. $p(11 \text{ beating a } 6) = 21/68$

13. $p(12 \text{ beating a } 5) = 20/68$

14. $p(13 \text{ beating a } 4) = 14/68$

15. $p(14 \text{ beating a } 3) = 13/68$

16. $p(15 \text{ beating a } 2) = 4/68$

17. $p(16 \text{ beating a } 1) = 0/68 = 0$ (never happened in men's tournament).

In the 2001 tournament, there were 7 upsets, plus the 10 seeds won 2 of their 4 games. We further note that a 10, 11 and 12 seed all reached the Sweet 16, meaning that these seeds won also in the second round in order to advance as they did. We particularly note that the 12 seed has an interesting tendency to reach the Sweet 16, because 12 seeds have the following:

18. $p(12 \text{ seed winning in second round}) = 11/20$, which is 55% !

We might speculate that the lower seeds, who have won conference championships or conference tournaments from so-called mid-level or lower level conferences, have a lot to prove in the first round against mid-level teams from the big-time conferences, who might not have been that good of a team, and who did not take their "lesser" opponent seriously.

Therefore, when you or your students try to PREDICT the outcome of a tournament of this nature, which is single-elimination (regardless of the sport), consider the FOLLOWING:

19. At least one #1 seed has failed to make the Final Four each year!

20. The team ranked #1 in the final pre-tournament poll in March has rarely won the NCAA Championship!

21. A 16 seed has never beaten a 1 seed in the 17 years of the tourney.

22. There has been at least one upset every year, and sometimes as many as 7 in the first round (even more if you include the 7-10 game)!

23. Low seeds have reached the Sweet 16 by winning first and second round games, but only one low seed (a #11) has reached the Final Four (in 1986)! Therefore, you should look to predict a number of first round upsets, taking into account the teams, their conferences, how well they played in their last 10 games, how they did in their conference tournament, and so forth. Also, be prepared for many top seeds to fall before the Final Four (many of these teams may have been overrated). You and your students should enjoy this, look for other patterns and possible predictions, and modify this for other sports and tournaments.

REFERENCES:

1. Official 2002 NCAA Men's Final 4 Tournament Record Book, by Gary Johnson. Published by the NCAA.

2. College Basketball Magazine 2002, published by the Sporting News.

Campy on Campus, by Elaine Dinto,

Naugatuck Valley Community College

On May 17, 2002, six Connecticut community college math departments hosted a day of workshops for mathematically talented 5th - 8th graders and their teachers. Approximately 500 students and their chaperones from across the state experienced a day of interactive, engaging, high quality programming.

CAMPY (The Connecticut Association for Mathematically Precocious Youth), a non-profit organization created to serve precocious and talented mathematics students, is comprised of educators, parents, business leaders, and others interested in advocating for these students. Planning for the May 17 event began nearly two years prior when Judy (St. Marie) Dailey, from the Montville Schools and CAMPY Chairperson, asked our own Kathy Bavelas if she thought there might be some interest at the community colleges in assisting the CAMPY organization reach out to more mathematically talented students than they could accommodate with their annual conferences at Wesleyan.

Along with five math colleagues, Miguel Garcia (Gateway), Kathleen Bavelas (Manchester, with assistance from Alice Grandgeorge), Marilyn Seman (Norwalk), Marion Egan (Quinebaug Valley), and Linda Tremor (Three Rivers), I volunteered to serve as on-site coordinator for the events. On-site coordinators were responsible for finding presenters and scheduling five morning and five afternoon sessions, which included challenging, hands-on, problem-solving activities. We encouraged colleagues, business and other professionals to present and assisted them,

advertised the event, wrote programs, coordinated room and computer requests, planned menus, etc., etc. MATYCONN members who presented at their campuses include Kathy Bavelas and Barbara Paskov (Manchester), Joe Karnowski (Norwalk), and Slav Sharapov (Quinebaug Valley).

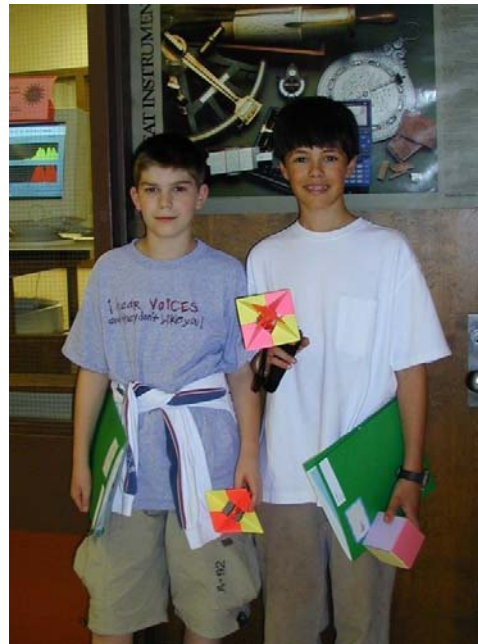


While I can speak only for myself, CAMPY on Campus was a wonderful experience. That is not to say that we did not have problems, specifically with a presenter's late cancellation, a host of last minute registrations, and a "lost" (but found, on another campus 40 miles away!) bus.

Restricted budgets also resulted in a lack of support from nearby inner city schools. Although money for busses was not available, in hindsight, it was unfortunate that we did not encourage more parents to drive.

On the other hand, everything else was terrific. Our presenters, including four professors from Western CT State University and another from the University of Connecticut, the education director at the Institute of American Studies, a nutritionist, a structural engineer, and an architect, were fantastic! Our sessions included the following: *The Wonderful World of Fractals; The Mathematics of Space; Planning Your Own Home; Design Your Own Wallpaper; Bridge Walks, Cheap Trips, and Map Coloring; Investigations in Graph Theory; Design of Structures -- Schools to Skyscrapers; Numbers, Food, and Nutrition; Math and Modular Origami Polyhedra; Numbers, Archaeology, and the Indians of the Americas.* I witnessed students in the architect's session remain in the class after lunch was announced, eager to finish up their floor plans and get their "homework" assignment! When I thanked the architect for presenting, he responded, "No, thank you. I had a great time!"

There were so many folks at Naugatuck Valley, both faculty (including an Engineering Technology professor and MATYCONN members Dorothy Libron-Green, Sandy Pettinico, Bonnie Simon, and "wonder man" Bob Lynott), and staff, whose assistance was essential in making this day so successful. I had support from our Dean as well as support from our secretaries, security, maintenance, admissions, scheduling, media services, graphics, publicity, cafeteria services, copy center, and Information Technology personnel. CAMPY Board members who assisted me were fabulous. Chaperone comments were extremely positive (many went home with ideas to use in their own classrooms), and student comments included, "I can't wait to come back next year" and "that was awesome!"



In spite of all the energy and work involved, my CAMPY experience was a truly rewarding one. If even a couple of the youngsters were inspired to continue taking math courses, or if a session sparked an interest in one student so that it starts him/her on a career path, wouldn't that be splendid! I would definitely become involved again, and would strongly encourage math faculty (who are not faint of heart) to do so next time around. (2004?) *Campy on Campus was awesome!*

ASSESSING STUDENT LEARNING

By Kathleen Herron, Capital Community College

In July 2000, Capital Community College was awarded a five-year Title III grant. One of the activities of the grant is to assess student learning. In Capital Community College's design for Student Learning Assessment, individual programs are responsible for refining and assessing their goals according to cycles that fit with program review, certification, or internal examination schedules. At the same time, the broader curricula of General Education and Developmental Education require ongoing assessment, and the plan is to implement one large cross-curricular assessment each year for these areas. Since both General Education and Developmental Education share the goal of *effective writing*, the first year of implementation was devoted to sampling student essays to determine how well our students are meeting that goal. Similarly, the second year of implementation focused on determining how well students are doing in mathematics, since students' ability to reason quantitatively is also a goal of both General Education and Developmental Education. This report briefly discusses the mathematics assessment that Capital is currently working on.

The assessment team first identified four mathematical categories that we believe students should be proficient in. They included: Numbers & Operations, Algebra/Geometry, Graphing, and Mathematical Modeling. We decided to use an article that was on the front page of the Hartford Courant in May of last year entitled "Poverty's Web Widens" as the basis for the assessment questions. The article discussed the changes in median income in the past decade in the 169 towns of CT and we believed this topic was something our students would be interested in or should be interested in.

The graphic created in the article is a map of Connecticut showing the percentage change in income for Connecticut's towns by color (you can access the graphic by going to Capital's website—see info at end of this paper). The blue shows an increase in income of 12.1% to 31%, the gray an increase of 4.1 to 12% and the other colors show a decrease in income in the last decade. If you look at Hartford, where many of Capital's students live, it shows it was in the category of the largest decrease in income.

Some of the questions we asked included: (1) Find the median income for Darien, CT in 1999 and then use the percent change in income from 1989 to 1999 to find the 1989 median income. Although this question may seem quite straightforward at first glance, this question was difficult for many students. Another question asked the students to complete a table predicting the Hartford median income in future decades if the decrease in income in terms of dollars continued at the same rate as it did for the past decade. Another asked the students to create a histogram of the number of towns at various median income levels. We included questions that assessed student's competency in each of the four math categories I mentioned earlier.

Ten instructors assigned this project to their students in a total of 18 class sections.

Courses in the project included biology, ESL, marketing and mathematics among others. The Assessment Team collected over 400 papers and then randomly selected 90 papers for scoring. The Team used the same scoring system as we did for the Common Writing Assignment where 4 is superior, 3 is proficient, 2 is essential and 1 is in progress. So what were the results?

Overall, the average holistic score was 2.36, which is higher than an essential score, but not quite proficient. The students scored the highest in the algebra/geometry category and the lowest in mathematical modeling. We expected the students would have the most difficulty with the modeling questions where they were asked to interpret what the numbers were saying. But we were surprised at the weakness we saw students exhibiting on the graphing questions. Since the visual representation of quantitative information is important to many disciplines, we decided to focus on graphing for the spring assessment project.

The spring project uses the same article we used in the fall, "Poverty's Web Widens." Outside of class the students will read the article and use the data table to answer a general question about the data. Then in class they'll spend 30 minutes solving three problems that involve graphs. The teacher can grade the student's work in any way they choose for the course. Later the Assessment Team will score anonymous copies of the papers to obtain ideas on how the college can improve our students' math skills. For the spring project, we worked hard to make it simpler and leaner than the fall version, since some fall participants found the first common math assignment a bit complicated.

Another observation from the fall project was that students were able to read the article and do some of the problems, but had a lot of difficulty when asked to put the numbers and words together to draw ideas and conclusions from the mix. This runs parallel with results of the Common Writing Assignment, which showed student weakness in "development of ideas." This is supported by widespread teacher observations that students don't read well—they can decode the words but don't engage in constructing meaning. This may provide the Assessment Team some guidance for our Critical Thinking assessment next year.

If you are interested in learning more about Capital's work on student learning assessment, please go to our website (ccc.commnet.edu) and then following the following links: College Web-Page Directory/Institutional Assessment Portfolio/Assessment of Student Learning/General Education/Page down to find Common Math Assignment.

TEST YOUR MENTAL AGILITY

This test does not measure your intelligence, your fluency with words, and certainly not your mathematical ability. It will, however, give you some gauge of your mental flexibility and creativity. In the years since this test was developed, we have found few people who could solve more than half of the 24 questions on the first try. Many, however, reported getting the answers long after the test had been set aside, particularly at unexpected moments when their minds were relaxed, and some reported solving all the questions over a period of several days. Take this as a personal challenge. No prizes, no rewards, just self-gratification.

INSTRUCTIONS: Each equation below contains initials of words that will make it a correct statement. Find the missing words.

EXAMPLE: $16 = O.$ in a $P.$ (Answer: $16 = \text{Ounces in a Pound}$)

1. $26 = L.$ of the $A.$
2. $1001 = A.$ $N.$
3. $7 = W.$ of the $W.$
4. $12 = S.$ of the $Z.$
5. $54 = C.$ in the $D.$ (with the $J.$)
6. $9 = P.$ in the $S.$ $S.$
7. $88 = P.$ $K.$
8. $13 = S.$ on the $A.$ $F.$
9. $32 = D.$ $F.$ at which $W.$ $F.$
10. $18 = H.$ on a $G.$ $C.$
11. $90 = D.$ in a $R.$ $A.$
12. $200 = D.$ for $P.$ $G.$ in $M.$
13. $8 = S.$ on a $S.$ $S.$
14. $3 = B.$ $M.$ ($S.$ $H.$ $T.$ $R.$)
15. $4 = Q.$ in a $G.$
16. $24 = H.$ in a $D.$
17. $1 = W.$ on a $U.$
18. $5 = D.$ in a $Z.$ $C.$
19. $57 = H.$ $V.$
20. $11 = P.$ on a $F.$ $T.$
21. $1000 = W.$ that a $P.$ is $W.$
22. $29 = D.$ in $F.$ in a $L.$ $Y.$
23. $64 = S.$ on a $C.$
24. $2.54 = C.$ per $l.$

NEW FEATURE

What's the Best Math-Related Book you've read recently?

From Alice Burstein, Middlesex CC

Stamping Through Mathematics, by Robin J. Wilson, Springer-Verlag (ISBN 0-387-98949-8) is a delightful little book representing a new and different approach to mathematics history. The odd numbered pages contain images of stamps with mathematical themes, while the even numbered pages contain very brief (averaging less than one paragraph per stamp) explanations. If you are a dedicated reader of the "Stamp Corner" feature in *The Mathematical Intelligencer*, you will know that the author is a long-time contributor.

There are no mathematical prerequisites to the enjoyment of this book. It features stamps from all over the world representing all aspects of mathematics from history to applications, from ancient to modern, from important discoveries to games. A glance at the cover with its colorful, varied stamps, invites the reader to look inside.

This book is interesting and fun. I recommend that you read it yourself and share it with your students.

From Peg Cibes, Hillyer College

Selling It: The Incredible Shrinking Package and Other Marvels of Modern Marketing, by Leslie Ware (ISBN 039332172x), from Consumers Union, is a collection of the best (that is, the worst!) of the past decade's marketing come-ons from the back pages of *Consumer Reports*. In a successful effort to expose and inform, it compiles the best of the bad ads over the years, giving hilarious, misleading, absurdly amusing *good examples of bad math*.

To share a "Current Favorite," please send information to BSimon@nvcc.commnet.edu or EDinto@nvcc.commnet.edu.

*Thanks to Peg Cibes for the great idea!

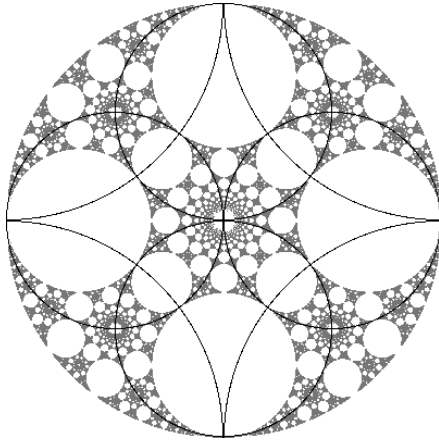
A “GROSS” ENDEAVOR

At the end of this semester I will have finished 50 years of being in the mathematics classroom as a teacher (the 50 years have been accumulated at three places: MIT, Corning (NY) Community College and Bunker Hill Community College). At the end of this year I will be retiring from BHCC but I will not be retiring. Rather I'll be working with my son, Steven, who is the Director of the Boston Trauma Center's Community Outreach Program and who is an expert in trauma intervention, such as what occurred on 9/11 as well as when people experience a very violent act such as witnessing a murder, hearing about a suicide of a friend or relative, etc. As part of his work he gives workshops, seminars and other forms of training to groups who come into contact with traumatized people. Among the groups of people with whom he works are the teachers who work with students who have been traumatized and his specialty with these teachers is to give them guidelines for how we can make the classroom physically and emotionally safe. After having had several in depth conversations with him about his work we came to a consensus that one does not have to have experienced a traumatic event to find the classroom, especially the math classroom, to be a threatening place. So, at the end of this semester I will begin working with him on developing what we are calling the "Academically safe" classroom. The proposed workshop is designed to discuss guidelines for removing artificial obstacles from the students' learning experience in ways that will enhance the comfort level of both students and their teachers but without destroying what teachers see as their primary mission. A major goal of the proposed workshop is to look at viable approaches for holding the degree of mastery constant and varying the time it takes for the student to obtain this degree of mastery.

We are also beginning to think about forming a "Math Academy" in several of the Boston schools that will in effect be learning centers where anyone who needs additional help with mathematics (teachers as well as students) can come, get mentoring and watch videos and CD-Rom etc.

From Herb Gross
Bunker Hill Community College

The Matyconn membership wishes you, “The best of luck” on your new endeavor.



Fractal Geometry Summer Workshop

for high school,
community college, and
college/university teachers

August 11-15, 2003

Location: Yale University

Presenters: Michael Frame, Nial Neger, Benoit Mandelbrot

Topics:

Monday -- Introduction to fractals and iterated function systems

Tuesday -- Quantifying fractals: how dimensions need not be integers

Wednesday -- Julia sets and the Mandelbrot set

Thursday -- Cellular automata and their relatives

Friday -- Random fractals and the stock market

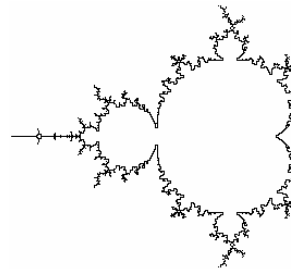
In addition to lectures and demonstrations, the workshop includes hands-on activities and examples of student work.

Goals: To demonstrate the wide scope and appeal of fractal geometry. To encourage the incorporation of these ideas in your courses. To demonstrate strategies for using the web as a teaching device. To set up a program of curriculum development workshops throughout the year.

Format: Morning sessions (9:00 am to noon) will be conducted by Michael Frame and Nial Neger. Mathematical background will be followed by examples and applications, and hands-on activities. Lunch will be provided (noon to 1:00 pm). Afternoon sessions (1:00 pm to 3:00 pm) will begin with more examples and conclude with discussions. Benoit Mandelbrot will speak during one of the afternoon sessions.

Participants will receive a stipend and some materials, including *Fractals, Graphics, and Mathematics Education*, and preliminary versions of a fractal geometry lab manual and a junior-senior college fractal geometry text currently being developed.

CEUs are available for Connecticut Public School teachers. Twenty-five hours, 2.5 CEUs, will be awarded for the full five days.



If you would like to attend, please return a **statement of interest** by **April 4, 2003**, to

Michael Frame
Mathematics Department
Yale University
10 Hillhouse Av.
PO Box 208283
New Haven, CT 06520-8283
or email
michael.frame@yale.edu

Be sure to include your school affiliation and a mail or email address at which you can be contacted.

Signpost Forest and Linear Regression

By Alice Burstein, Middlesex Community College

My husband, Bob, and I have traveled the Alaska Highway twice, the first time in 1968 and then again in 2002. In 1968, only two hundred miles of the highway, from the Alaska border to Delta Junction, the end of the highway, were paved and graded. The rest, from Milepost 0 at Dawson Creek, British Columbia to Historic Milepost 1221 at the Alaska border, was all gravel. It was as curvy as it had been when the army constructed it in 1942 when the serpentine curves were part of the strategy to make the road difficult for enemy bombers to destroy.

The road is very different now. It has been regraded, totally reconstructed in places, and paved completely. The Milepost, self-proclaimed "Bible of North Country Travel Since 1949," indicates that one particular "major rerouting eliminated 132 curves on the stretch of highway that originally ran between Miles 234 and 275." (2002 Edition, page 116) Notwithstanding the road improvements, travelers still depend on The Milepost and other books that list the milepost and description of every town, gas station, motel, store, turnout, litter barrel, bridge, viewpoint, and other point of interest along the Alaska Highway.

Among the many interesting places along the route, at milepost 635, in the town of Watson Lake, Yukon Territory, Canada is the famous Signpost Forest. Carl K Lindley, a GI from Danville, Illinois placed the first sign at Watson Lake in 1942 while he was working on construction of the Alaska Highway. Other workers added signs of various shapes and sizes indicating their names or hometowns. After the war and the opening of the Alaska Highway for civilian use, many others added even more signs.



In 1968 when Bob and I erected our first sign, there were approximately 700 signs at Watson Lake. At that time, there was a small clearing where travelers erected their signs on posts they brought with them or attached their signs to other people's posts. In 1988, the town enlarged the area designated for signs, installed twelve-foot signposts, and assumed responsibility for maintaining what is now known as the Signpost Forest. The town leaves a ladder in the forest so people can reach the tops of the posts. The official count at the end of each September shows steady growth in the number of signs, from 6,281 in 1988 to 47,125 in 2001.

The signs vary in size and shape. While some are professionally made, most are hand-made from Styrofoam plates, pots and pans, posters, wood (scrap or otherwise), metal trays, shoes, old tires, axes, toilet seats, license plates, gold pans, birdhouses, and almost anything else you can think of. There are signs from almost every state, as well as Canadian provinces and territories and many other countries.



Last summer, Bob and I discovered that the Signpost Forest has changed as much as the highway has. In the Watson Lake Visitors' Centre there was a display giving the sign count for the years 1988 to 2001. (There are no official counts for prior years.) I emailed the Yukon Territory Tourism Bureau to obtain that information and received the following reply.

Subj: Watson Lake Sign Forest Count
Date: 8/2/02 11:40:56 AM Eastern Daylight Time
From: VRC.WatsonLake@gov.yk.ca
(VRC.WatsonLake)

Dear Mrs. Burstein,
Good morning. We were contacted by our head office with your request for our sign count.

We began counting the signs in 1988 and count them yearly at the end of our season in September.

1988 - 6281
1989 - 7967
1990 - 9270
1991 - 12,847
1992 - 17,588
1993 - 20,586
1994 - 25,695
1995 - 29,341
1996 - 31,998
1997 - 37,450
1998 - 41,602
1999 - 42,015
2000 - 44,335
2001 - 47,125

We expect that this year's count will result in us now having over 50,000 signs. If you would like to know this year's count, please e-mail tourism Yukon mid-September and they (or us) will get back to you.

Thank you for your inquiry. We hope you enjoyed your northern vacation!

Jennifer
Watson Lake Visitor Reception Centre



I entered the data into my TI calculator, created a scatterplot, and discovered that I could use it as the basis of an example on one of my Statistics tests. Before the test, I told students about the Signpost Forest and showed them several pictures of the Signpost Forest and of some individual signs. After including most of what is written above, I asked students to complete the following exercises:

- Sketch a time plot of the data, with years from 1988 to 2001 on the horizontal axis and sign count on the vertical. (1988 is year zero, 1989 is year 1, etc.) Show your scale on each axis.
- Describe the relationship (if any) between the years and the sign count. Does there appear to be a linear relationship? If so, how strong does it appear to be? If not, does there appear to be any pattern at all? Describe the pattern. If the relationship appears linear, complete all of the following parts.
 - Give the least squares regression equation and sketch its graph on your time plot.
 - Give the vertical intercept and explain its significance (if any) in the context of the problem.
 - Give the slope and explain its significance (if any) in the context of the problem.
 - Give the correlation coefficient.
 - Predict the 2002 sign count using the regression equation. Is the Watson Lake Visitor Centre estimate close to the predicted value found using the regression equation?



COLLABORATIVE LEARNING IN THE MATHEMATICS CLASSROOM

By Patricia Hirschy, Asnuntuck Community College

INTRODUCTION

Collaborative learning has been employed in many disciplines as an effective instructional strategy. The mathematical sciences, however, have had a long history of relying on lecture as the primary instructional method to present material. Current economic, social and political forces are questioning this approach, resulting in a consideration of collaborative learning as well as other alternative instructional methodologies.

MATHEMATICS EDUCATION REFORM

The traditional mathematics curriculum was primarily developed by the turn of the last century, the late 1800s and early 1900s. Mathematics has often performed the role of "filter" in undergraduate education and was a prominent factor in student decisions on future career directions.

Throughout the 1980s, there was much public attention and concern regarding the effectiveness of American education practices when considered from an international perspective. Concerns with the current educational practices resulted in calls for reform (Cawelti, 1993, p. 136). As expressed by Gordon (1994), "The mathematics community is beset on all sides with pressures to introduce significant, far-reaching changes into our entire curriculum, a curriculum with which we have been very comfortable for our entire professional lives" (p. 9).

The mathematics education community responded with proposals of a reform movement towards "mathematics for all" with efforts to both improve mathematics education and to encourage more students to study mathematics. This movement has progressed as a result of professional discourse among the education, corporate, legislative, and public arenas. Mathematics educators in the two-year college community responded with the 1995 publication *Crossroads in Mathematics: Standards for Introductory College Mathematics Before Calculus*, referred to more simply as *Crossroads*. This publication investigated three dimensions of learning and education -- intellectual development, content, and pedagogy. Interactive and cooperative learning are instructional approaches receiving particular attention. Mathematical literacy is "best accomplished when students have an opportunity to read, write, and discuss mathematical problems and concepts" (p.16).

CONSTRUCTIVISM AND COLLABORATIVE LEARNING

Accompanying this call for reform was a growing dissatisfaction among members of the educational community with behaviorist and objectivist views of learning and an increased interest in constructivist theory of learning (Cawelti, 1993, p. 136). Constructivist theory is based on the assumption that students need to construct their own knowledge. As Cawelti (1993) explains, "Each learner comes to school with different tools, depending on their personalities, cultures, and prior experiences" (p. 150). Thus, it is important to "find ways to help students feel safe in presenting and discussing their ideas and to have students think and work like mathematicians" (p. 152).

As a group activity, collaborative learning involves both social and learning skills. It integrates three concepts -- individual accountability, group benefits, and equal achievement of success (Kemp, 1998, p. 155). The goal of collaborative learning is to promote student interaction for understanding an assignment. In the classroom, it is often incorporated with other instructional approaches. However, with new attention being focused on alternative assessments, there is also an increased use of collaborative learning for out of class activities such as projects.

IMPLEMENTING COLLABORATIVE LEARNING

I entered the world of collaborative learning with great trepidation. After all, I was challenging all the years of my formal mathematics experience that had successfully led to a graduate degree in applied mathematics. Add to this the fact that my attitudes, values, and skills in teaching were developed solely from my personal experiences in the classroom. Although I had been teaching college classes since 1971, I had never taken any formal courses in education. Also, it is particularly challenging in the mathematics discipline to identify strategies to have students construct their own meaning of mathematical concepts in a short semester course when these concepts have taken mathematicians centuries to develop. I decided to base my first foray into collaborative learning with an authentic application adjusted to elementary algebra, intermediate algebra, and precalculus levels. In each course, I divided my students into groups and as a whole class exercise we completed a handout describing analysis of carbon dioxide levels in the atmosphere. I then gave the students a project that required students to perform a similar analysis technique to world population data. The objective of the analysis was to suggest social, political, and economic consequences of population trends and to support the suggestions with quantitative analysis. Assessment for the activity was based on a group oral report given to the class and an individual written report. The students were encouraged to work together, and one group grade was assigned to each student in the group. The activity was disastrous, not a promising start especially given that it was my first semester at a new job. I'm not sure who was more disappointed, the students struggling to complete the assignment or the instructor reading the honest but negative student evaluations. Thus, I painfully learned my first lesson in implementing collaborative learning -- think big but start small.

LEARNING FROM EXPERIENCE

In retrospect, I realized that I was not the only one who had been conditioned by my previous mathematics experiences. My students had been in the same classroom environment as I, with the professor furiously filling board after board with equations, the students frantically scribbling away to record the strange and unfamiliar symbols before the professor erased this vital information, and the homework assignment "every odd problem on page 123". Although many of the students had not been successful with this approach, it was still all they knew. And it was what they expected, even if it again led to failure. If I was going to be successful with collaborative learning, it was important to prepare my students for this new experience in the classroom.

NEXT STEPS

It was clear that I needed to research the strategies for collaborative learning. I read journal articles, skimmed books, and talked with colleagues. I learned that the group size should be between 2 and 5 students, or perhaps no more than 4 students. The groups should be formed randomly, or perhaps by academic skills, or perhaps by student choice. The grades should be assigned on a group basis, or perhaps on an individual basis. The tasks should be open-ended, or perhaps well defined. Collaborative learning should be used for the entire class period, or perhaps for only for a portion of the class period. In short, my research resulted in differing and sometimes contradictory suggestions. Undaunted by this, I decided that there are no universal standards for collaborative learning, only guidelines. This was not a problem, but instead offered me an opportunity to experiment in my classes to determine what worked best for my students.

I decided to use group work regularly throughout the term in all my classes, beginning with the first class. I reconfigure the groups on a regular basis so that the students have the opportunity to meet everyone and can identify with whom they are comfortable working. I vary the instructional techniques in each class so that group work is used only part of the class time. I clearly define the task, exactly which problems are assigned and what time limit. When a project is to be graded, I encourage the students to work together but to report their results individually. I then assign

individual grades to the students based on their reports.

CONTINUING CHALLENGES

One of the benefits of constructivist teaching is also its bane. Because this approach emphasizes individuality and flexibility, there is no one recipe that will work for all situations. Problems cannot be solved in advance by any designer of reform but need to be resolved as needed in a particular situation (Kemp, 1998, p. 138). However, some teacher skills have been identified for successful constructivist teaching: see oneself as a learner, listen to and respect students' ideas, develop strategies for sense-making not authority, develop a culture of a classroom community to "share, debate, construct, modify, and develop important mathematical ideas and ways of problem-solving" (Kemp, 1998, p. 153-154). Another challenge is to determine when to use collaborative learning and when to use another approach. Factors to determine which is the most appropriate approach include the content being covered, the skills of students, cohesion within the class, and class diversity, to name a few. These factors are variable, so generalizing to ideal contexts is difficult. "Combining orientations to fit instructional conditions and individual needs is a sensible approach that can potentially yield benefits much greater than could be attained using any one method alone." (Kemp, 1998, p. 157).

Creating a classroom culture to best implement collaborative learning is yet another challenge. The students need to develop a sense that they are a community of mathematicians with a common motivation to "share, debate, construct, modify, and develop important mathematical ideas and ways of problem-solving" (Kemp, 1998, p. 153-154). The students need to value their differences and learn from one another. In addition, they need to "maintain self-confidence and enthusiasm in the face of...critical-sounding peers and [give] the courage to return to the fray" (Cawelti, 1993, p. 153). This is a particularly difficult task due to the diversity of students in two-year college mathematics classes. Some students are older, have been out of school for a long period of time, may never have been successful in mathematics, and have an anxiety that produces significant stress. Other students are youngsters, have been exposed to much of the material very recently, and view their performance in the classroom as an individual and competitive event. It is not just a skill but in fact an art for a mathematics professor to overcome this diversity and resolve it into an interactive and motivated community of learners.

CONCLUSION

I believe that collaborative learning is a valuable instructional strategy that can be used effectively in any mathematics classroom and for any mathematics course. The key is to determine under what conditions it is most appropriate, which is no easy task. However, preliminary research indicates that "students will remain enrolled in a [mathematics] course and have a better probability of successful completion when they are involved in working cooperatively with their peers, support each other's learning, and encourage members of the group to participate in daily activities" (Keeler, C. M. & Voxman, M., 1994, p. 43).

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Join Our Domain, See Our Range

TOP $\sum_{i=1}^4$ REASONS 2 B \in {MATYCONN MEMBERS}

10. Win \sum free stuff
 9. See the latest in tech 'n' text
 8. Stay current within the field
 7. Travel the state
 6. Free Newsletter subscription
 5. Join a \cong cast of characters
 4. Seminars and workshops
 3. Networking = \int_0^∞ peers
 2. Enhance your promotion portfolio
- And the #1 reason to be a MATYCONN Member is
- π arties**



MATYCONN Nominating Committee's

PROPOSED SLATE OF OFFICERS for the 2003-2004 Academic Year

Voting will take place at the April 25, 2003, Meeting at Capital Community College

President: Alice Burstein (Middlesex)
Write-in _____

Vice President: Joe Karnowski (Norwalk)
Write-in _____

Secretary: Barbara Paskov (Manchester)
Write-in _____

Treasurer: Bob Lynott (Naugatuck Valley)
Write-in _____

Membership Chair: Cora Preibis (Middlesex)
Write-in _____

Math Contest Coordinator: Steve Krevisky (Middlesex)
Write-in _____

Minority Scholarship Coordinator: Slav Sharapov (Quinebaug Valley)
Write-in _____

Newsletter Editor: Bonnie Simon and Elaine Dinto (Naugatuck Valley)
Write-in _____

Webmaster: Elaine Dinto (Naugatuck Valley)
Write-in _____

